King County
Department of Permitting
And Environmental Review
35030 SE Douglas Street, Suite 210
Snoqualmie, WA 98065-9266
206-296-6600 TTY Relay: 711
www.kingcounty.gov

Large Lot BMP Requirements
2009 King County Surface Water Design Manual Appendix C

Residential Site Plan Instructions

Information and Instructions for Residential Site Plan

Following these step-by-step instructions will allow you to create a complete and accurate comprehensive site plan that enables the Department of Permitting and Environmental Review (Permitting) to more efficiently and predictably review and approve your residential permit. The Residential Site Plan is designed for lots larger than 22,000 square feet in area and less than 10,000 square feet of proposed new impervious and/or impervious surface added after January 8, 2001. The instructions are designed to provide references, definitions and a step-by-step process to use the 2009 King County Surface Water Design Manual Appendix C to design your residential site plan.

Prior to scheduling an intake appointment you will be required to go through the Pre-Submittal Services (PSS) process. See the Pre-Submittal Services information and submittal checklist.

Why Flow Control Best Management Practices (BMPs) are Necessary for Small Projects

On undeveloped land most rainwater soaks into the ground and flows slowly to nearby lakes and streams through the upper layers of soil. When that same area is cleared or covered with an impervious surface, the rainwater is no longer captured by dense vegetation and forest duff, but flows quickly and in greater quantities across the site and through pipes and channels to streams and lakes. Also, as it flows over developed surfaces (e.g., driveways, roads, lawns, and pastures), various pollutants generated by human uses of the land are picked up and carried downstream. The increased quantities of runoff from the site, when combined with increases from other sites, result in increased flooding and erosion of downstream properties and damage to aquatic areas habitat. The pollutants collected by the runoff degrade the water quality and habitat functions of streams, lakes, and wetlands. Larger developments address these impacts by storing the runoff in engineered flow control facilities (e.g., detention or infiltration ponds or vaults) that slowly release the runoff downstream.

Controlling flows from small projects is just as important as controlling flows from large developments, because the cumulative effect of uncontrolled flows from many small projects can be equivalent to those from a single large project. For most small projects, however, engineered flow control facilities may not be practicable or even warranted if the quantity of runoff from developed surfaces can be minimized, dispersed, or otherwise infiltrated onsite through the use of flow control BMPs. The same holds true for water quality facilities. While the primary focus of flow control BMPs is to mitigate increased runoff quantities, they are also effective in mitigating increased pollution generated by developed surfaces.

Why Erosion Sediment Control (ESC) is Necessary

ESC measures are necessary because land disturbing activity associated with clearing and grading exposes a site's soils to erosion by stormwater. The soil eroded from disturbed areas is referred to as *sediment*, which is washed downstream and deposited in pipes, ditches, streams and lakes. Sediment deposited in a pipe or ditch reduces its capacity to convey flows and can increase the likelihood of flooding. Sediment deposited in streams clog the gravels that salmon use for spawning. Nutrients contained in the eroded soil that reach lakes can upset the chemical balance of the lake, causing excessive growth of algae, milfoil, and other plants, and decreasing recreational uses such as swimming, boating, and fishing. ESC measures are typically used during construction to prevent soil erosion and/or transport of sediment downstream until the site can be stabilized with vegetation cover/landscaping. Other construction activities such as the use, handling, and storage of materials, chemicals, equipment, and fuel can result in contaminates coming into contact with stormwater and potentially washed downstream. Therefore, pollution prevention measures applicable to specific construction activities need to be implemented to avoid the discharge of pollutants from the construction site.

Utility of Appendix C

For projects in Small Project Drainage Review, this appendix outlines the drainage requirements, flow control BMPs, and ESC measures, necessary to mitigate the stormwater impacts of development without the construction of expensive stormwater facilities (i.e., flow control and water quality facilities). For projects in Full Drainage Review or other types of drainage review, the flow control BMPs contained in this appendix are referenced for application to any size or type of project as specified in the 2009 Surface Water Design Manual (*SWDM*.) In fact, because flow control facilities cannot mitigate all the impacts from developed surfaces, flow control BMPs are required to some extent on nearly all projects in drainage review regardless of whether stormwater facilities are required. (See *SWDM* Section 1.2.3.4, "Flow Control BMPs Requirement").

Residential Site Plan Step by Step Directions.

Step 1: Determine your lot size.

If your site/lot is smaller than 22,000 square feet, your project must comply with the Small Lot flow control BMP application requirements in section C.1.3.1 (page C-13) of Appendix C of the 2009 King County Surface Water Design Manual (SWDM) and you may use this worksheet.

If your site/lot is larger than 22,000 square feet, your project must comply with the Large Lot flow control BMP application requirements in section C.1.3.2 (page C-15) of Appendix C of the 2009 King County Surface Water Design Manual (SWDM). You will need to use the Large Lot BMP worksheet.

Step 2: Site Plan

Prepare a proposed site plan on the Site Plan Template. The following information must be included on **all residential** site plans, subdivision site improvement plans, and small site ESC plans, unless otherwise directed by the Department of Permitting:

Identification

- Name, address, and phone number of applicant
- Parcel number
- Dimension of all property lines, easements, and building setback lines
- Street names and existing or proposed property address
- Section, township, and range of proposal.
- North arrow
- Legend, if needed
- Scale - use a scale that clearly illustrates drainage features and BMP/measures (1"=20' is standard scale; minimum acceptable scale is 1"=50'). If necessary, split the site plan into two or more plan sheets and indicate a "match line" on each sheet to show how the sheets splice together. A variation of this approach is to use separate scales for the project site versus the entire site and draw them on separate plan sheets.

Building and Site Development Features

- Footprint of all structures (existing and proposed)
- Parking, roads, and driveways (existing and proposed)
- Sport courts and any other paved or impervious surfaces (existing and proposed)
- Pervious surface land cover (existing and proposed)
- Location of any retaining walls and rockeries (existing and proposed)
- Existing or proposed septic system, including all system components and both primary and reserve drainfields
- Utility structures (poles, fire hydrants, etc.)
- Existing wells or wells to be abandoned.

Topography

- Corner elevations of the *site*/lot
- Benchmark (a permanent mark indicating elevation and serving as a reference in the topographic survey) Section C.4 Small Project Drainage Plan Specifications 1/9/2009 - 2009 Surface Water Design Manual – Appendix C page **C-114**
- Datum [assumed datum is acceptable in many cases (i.e., fire hydrant base = 100'); datum for projects in or near FEMA floodplain should be NGVD 1929]
- Show 5-foot contours for all slopes steeper than 15% and delineate the top and bottom of these slopes
- For *sites*/lots that are 22,000 square feet and larger, show 2-foot or 5-foot contours as needed to design and demonstrate compliance with the minimum requirements and specifications for proposed flow control BMP and ESC measures.

Drainage Features and Critical Areas

- Location of all existing and proposed ditches, swales, pipes, etc.
- Delineation of all streams, wetlands, lakes, closed depressions, or other water features (including any required buffer widths)
- Delineation of all flood hazard areas, erosion hazard areas, steep slope hazard areas, landslide hazard areas, and their buffers and building setback lines
- Delineation of all drainage easements, tracts, and right-of-way
- Delineation of all critical areas as shown on any recorded critical areas notice on title.

Information Specific to Flow Control BMPs

In addition to the general information required in section C.4.2.1, the following additional information is required on FCBMP site plans and on subdivision site improvement plans that include installation of flow control BMPs within a dedicated tract or road right-of-way:

- Location and dimensions of flow control BMP devices such as dispersion trenches, infiltration trenches, drywells, ground surface depressions, rain gardens, permeable pavements, rain water storage tanks, and perforated pipe connections
- Delineation and dimensions of target impervious surface and new pervious surface
- Delineation and dimensions of vegetated flowpath segments, if applicable
- Delineation of native vegetated surface to be created and preserved
- Setback lengths between flow control BMPs and any property line, structure, steep slope, stream, wetland, or septic system.

Step 3: Determine the new and replaced impervious and pervious surface in square feet by using attachment Table A.

Definition of New pervious surface means the conversion of a native vegetated surface or other native surface to a nonnative pervious surface (e.g., conversion of forest or meadow to pasture land, grass land, cultivated land, lawn, landscaping, bare soil, etc.), or any alteration of existing non-native pervious surface that significantly increases surface and storm water runoff (e.g., conversion of pasture land, grass land, or cultivated land to lawn, landscaping, or bare soil; or alteration of soil characteristics).

Definition of New impervious surface means the addition of a hard or compacted surface like roofs, pavement, gravel, or dirt; or the addition of a more compacted surface, like paving over pre-existing dirt or gravel.

Definition of Replaced impervious surface means any existing impervious surface on the project site that is proposed to be removed and re-established as impervious surface, excluding impervious surface removed for the sole purpose of installing utilities or performing maintenance. For the purposes of this definition, “removed” means the removal of buildings down to bare soil or the removal of Portland Cement Concrete (PCC) slabs and pavement or Asphaltic Concrete (AC) pavement. It does not include the removal of pavement material through grinding or other surface modification unless the entire layer of PCC or AC is removed.

Step 4: Determine the requirements.

Use the questionnaire/flow chart (Table C.1.1.A pages C-6 through C-9) to determine the scope of requirements that will apply to your project in Small Project Drainage Review, and Targeted Drainage Review, if applicable. It will refer or direct you to more specific information on the application of requirements found in subsequent subsections, and in some cases, KCC Record this information on Table B attached to this package.

After reviewing table C.1.1.A and you determine if your project will be reviewed under the Large Lot BMP requirements of C.1.3.2. Proceed to Section A of C.1.3.2 for mitigation of impervious surfaces.

Step 5: Determine the Proper BMP for your site in Section A - C.1.3.2, page (C-15)

For projects subject to Large Lot BMP requirements, flow control BMPs must be applied to the project's target impervious surface according to the order of preference and extent of application specified in the following requirements:

Requirement 1: If this first requirement for full dispersion is met for the site/lot, no other flow control BMPs are required for mitigation of impervious surface and the remaining requirements below are optional.

Requirement 2: Where full dispersion of roof runoff (or equivalent) is not feasible or applicable, or will cause flooding or erosion impacts, the feasibility and applicability of full infiltration as detailed in Section C.2.2 (p. C-41) must be evaluated for roof runoff (note, this will require a soils report for the site/lot). If feasible and applicable, full infiltration of roof runoff must be implemented as part of the proposed project.

Requirement 3: For that portion of target impervious surface not addressed by Requirements 1 and 2 above, one or more of the following BMP must be implemented as part of the proposed project or will cause flooding or erosion impacts, one or more of the following BMPs must be applied.

- ☐ Limited Infiltration (see Section C.2.3)
- ☐ Basic Dispersion (see Section C.2.4), See Table C.2.1.A
- ☐ Rain Garden (see Section C.2.5)
- ☐ Permeable Pavement (see Section C.2.6)
- ☐ Rainwater Harvesting (see Section C.2.7)
- ☐ Vegetated Roof (see Section C.2.8)
- ☐ Reduced Impervious Surface Credit (see Section C.2.9)
- ☐ Native Growth Retention Credit (see Section C.2.10).

Requirement 4: Any proposed pipe connection of roof downspouts to the local drainage system must be via a perforated pipe connection as detailed in Section C.2.11.

Step 6: Determine the mitigation of new pervious surface

and generate a soil amendment plan to meet KCC 16.82.100(G). Go to the Department of Permitting website for the Soil amendment plan at **http://your.kingcounty.gov/ddes/forms/ls-inf-SoilPost-ConStd.pdf** and complete the soil amendment plan. Details shall be incorporated into the site plan on the Site Plan TESC BMP Template.
Note: Attach Soil Amendment Option sheet to submittal package.

Step 7: Design your Small Site Erosion/Sediment Control plan

Using section C.1.4.1 page C-20 to C-22 to determine the applicable ESC Best Management Practices and incorporate the BMP into the ESC plan on the Site Plan TESC Template**.**

Information Specific to Small Site ESC plans

In addition to the general information required in Section C.4.2.1, the following additional information is required on small site ESC plans, unless otherwise directed by the Department of Permitting:

- Delineation of proposed clearing limits (i.e., area to be disturbed)
- Type and location of ESC measures
- Notes indicating the location of any significant offsite drainage features within 200 feet of the discharge point(s) for the site/lot, including streams, lakes, and roadside ditches.

- ☐ Draw site plan;
- ☐ Show location of construction entrance
- ☐ Show clearing limits
- ☐ Show location of all TESC BMP used
- ☐ Show silt fence
- ☐ Critical areas boundary and associated buffer (labeled)
- ☐ Utilities.

Step 8: Prepare a Declaration of Covenant and Grant of Easement.

A declaration of covenant and grant of easement must be recorded for each *site*/lot that contains flow control BMPs. A draft of the proposed covenant must be reviewed and approved by the Department of Permitting prior to recording. The covenant in Reference Section C.5.2, p. C-125, (or equivalent) must be used. Print and complete information and attach to submittal package.

Step 9: Have plan reviewed by Department of Permitting technical engineers and critical areas staff.

Step 10: Submit a PRE-SUBMITTAL SERVICES Request Form to Permitting Services. Once you have completed the Pre-submittal Services process you will go to step 11.

Step 11: Submit your building permit application and required plans.

Table A

Proposed Impervious Surfaces: Fill in all applicable blanks below to list the square footage of all new impervious areas proposed on your parcel and existing. For buildings, measure out to the edge of the eaves.

	New	Existing	Total
House:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Detached Garage:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Outbuilding 1:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Outbuilding 2:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Driveways:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Sidewalks:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Patios:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Other:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Other:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Other:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Other:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.
Other:	_____ sq. ft.	_____ sq. ft.	_____ sq. ft.

Total New Impervious Surface _____sq. ft

Total Existing Impervious Surface _____sq. ft

Total _____sq. ft

Total Area Cleared/Graded: _____ Square Feet of new pervious area.

Volume of Excavation: _____ Cubic Yards

Volume of Fill (Exported): _____ Cubic Yards

Volume of Fill (Imported): _____ Cubic Yards

Table B

Submit the completed Table B with application package.

Summary of Questions in Table C.1.1.A Requirements:

1. Is the project subject to drainage review per section 1.1.1 of 2009 SWDM? Yes____ No ____

2. Is the project subject to Small Project Drainage Review per section C.1 and confirmed by the Department of Permitting? Yes ____ No ____

3. Is the project located or adjacent to a flood hazard area and confirmed by the Department of Permitting? Yes ____ No ____

4. Has the 100-year floodplain limits and base flood elevation been determined? Yes ____ No ____

5. Is the **project site** portion of the **site** located on land that is entirely outside of the 100-year floodplain boundary and above the base flood elevation determined in Question 1? Yes ____ No ____

6. Has a channel migration zone been mapped by King County for the flood hazard area? Yes ____ No ____

7. Does the site contain, or is it adjacent to an erosion hazard area? Yes ____ No ____

8. Does the site contain or is it adjacent to a steep slope or landslide hazard area? Yes ____ No ____

9. Is the project located in a basin planning area, community planning area, Critical Drainage Area (CDA), or other area with adopted area-specific drainage requirements AND does the project exceed the minimum thresholds for these drainage requirements as determined by the Department of Permitting? Yes ____ No ____

10. Is the project proposing one acre or more of land disturbing activity? Yes ____ No ____

11. Is the project proposing to construct or modify a drainage pipe or ditch that is 12 inches or more in diameter/depth, or does the project site receive surface or storm water from a drainage pipe or ditch that is 12 inches or more in diameter/depth (see Section C.1.2.6, p. C-12)? Yes ____ No ____

12. Are there any other drainage features onsite (swales, ditches, etc.) that may impact the proposed project or downstream properties or be impacted by the project? Yes ____ No ____

13. Is the proposed project on a site/lot smaller than 22,000 square feet? Yes ____ No ____